

Case Report

Contrast CT in Localization of Acute Lower Gastrointestinal Bleeding

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Localization of the source of acute lower gastrointestinal bleeding is of paramount importance in its management as it allows for planned segmental resection rather than a “blind” abdominal total colectomy. Various methods of localization with radionuclide scan, mesenteric angiography and colonoscopy have been utilized, but none has been shown to be superior to others. The recent use of contrast-enhanced multislice computed tomography (MSCT) has generated much interest as it is rapid, noninvasive and readily accessible, and allows for excellent reformation on different planes. These are clear advantages in an emergency setting for accurate localization prior to surgery. We report a case where the use of MSCT resulted in prompt and accurate localization in a patient who presented acutely with massive lower gastrointestinal bleed. We believe that contrast-enhanced MSCT has the potential of accurately localizing the source of bleeding in an emergency setting, and should be part of the algorithm in the management of acute lower gastrointestinal bleeding. [*Asian J Surg* 2006;29(2):92–4]

Key Words: acute lower gastrointestinal bleed, contrast computed tomography, localization

Introduction

Preoperative localization of acute lower gastrointestinal bleeding is important for the surgeon to plan a limited therapeutic colonic resection and to minimize the additional morbidity from a “blind” abdominal total colectomy. Although there are several methods of localization, the use of contrast-enhanced computed tomography (CT) has been increasingly used with success. We report a case where the use of contrast-enhanced CT allowed accurate localization prior to resection in an emergency setting.

Case report

A 72-year-old man was admitted with massive haematochezia of 2 days' duration. He had other comorbidities of ischaemic heart disease, chronic atrial fibrillation requiring anti-

coagulation with warfarin, hypertension and non-insulin dependent diabetes mellitus. On admission, his vital signs were stable. Abdominal examination was essentially normal. Proctoscopy did not reveal any bleeding haemorrhoids. Digital rectal examination showed stale blood clots in the rectum and no mass was palpable.

His initial haemoglobin was 9.5 g/dL and the international normalized ratio was 1.9. He was transfused with a total of three units of packed cells and fresh frozen plasma. This was followed by an urgent oesophagogastroscope up to D2, which did not reveal any pathology. Six hours following admission, the patient had another episode of massive haematochezia that was associated with sinus tachycardia and hypotension (blood pressure, 90/60 mmHg). Fluid resuscitation was promptly instituted. Colonoscopy was not attempted in view of his labile vital parameters, and an urgent contrast-enhanced multislice CT (MSCT) was performed

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Figure 1. Axial section view on computed tomography showing rapid pooling of contrast in the ascending colon following contrast administration (arrow).

with both arterial and venous phases, which showed active extravasation of contrast into the lumen of the ascending colon during the arterial phase (Figure 1).

An emergency right hemicolectomy was performed. The patient was managed initially in the intensive care unit and made an uneventful recovery. He was discharged 7 days after his admission with no further episodes of bleeding. Macroscopic examination of the resected specimen revealed small diverticula in the ascending colon (Figure 2). In one of the diverticula, surface haemorrhage was seen around its orifice. Outpatient review at 3 months showed him to be in good condition.

Discussion

The diagnosis and especially the localization of the source of lower intestinal bleeding is often a greater challenge than its management. Although bleeding can occur anywhere distal to the ligament of Treitz, colonic lesions are often implicated and haemorrhage from colonic diverticulosis is the leading cause.¹ Small bowel aetiology constitutes only 3–5% of all cases.² When a patient presents acutely with massive lower gastrointestinal bleeding, localization of the source allows for limited segmental resection rather than a total abdominal colectomy. Surgery, without preoperative localization, results in more extensive bowel resection and higher patient morbidity and mortality.³

Historically, radionuclide scanning has been used as an adjunct to conventional angiography in the diagnosis and localization of lower gastrointestinal bleeding. Radionuclide scans are easy to perform, noninvasive and generally well tolerated by patients. It is useful as it allows diagnosis of haemorrhage with a flow rate of less than 0.1 mL/min. However, it cannot be used confidently to guide surgical resection as localization is imprecise due to peristaltic movements of the radioactive tracer. For example, small intestinal bleeding may be misidentified as colonic and vice versa.⁴

Angiography, on the other hand, is more accurate in the localization of the bleeding source and allows for temporary cessation of the bleeding with the use of vasopressin or embolization. This therapeutic modality only stabilizes the patient temporarily prior to definitive surgical treatment. However, it is an invasive procedure fraught with the potential complications of ischaemic bowel and perforation. Moreover, it is a time-consuming procedure and may not be well tolerated by patients with unstable haemodynamics in an emergency setting.

Colonoscopy is an excellent method of diagnosing and localizing lower gastrointestinal bleeding in a prepared bowel, and it has the advantage of endoscopic haemostasis with bipolar diathermy, heater probe, adrenaline injection or a combination of these methods. However, its use in an unprepared bowel precludes adequate visualization and inspection of the mucosa due to the large amount of clots and stool. Negative or nondiagnostic findings have also been reported in up to 40% of cases.⁵ Furthermore, endoscopic haemostasis has not been shown to alter the need for surgery or the outcome of patients.⁶ The use of colonoscopy in patients with massive haemorrhage and labile parameters is also debatable.

Contrast-enhanced CT has been used more frequently in the localization of acute lower gastrointestinal bleeding. CT was able to localize bleeding in the entire gastrointestinal tract, including the small bowel and rectum.⁷ Newer generation CT such as MSCT has largely replaced conventional CT.

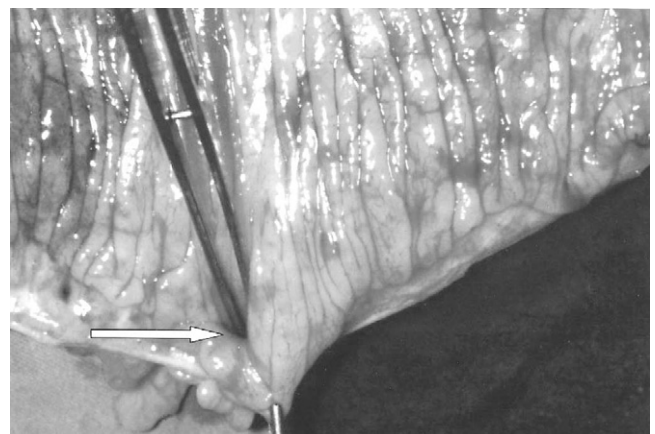


Figure 2. Macroscopic appearance of resected specimen showing diverticula in the ascending colon (arrow).

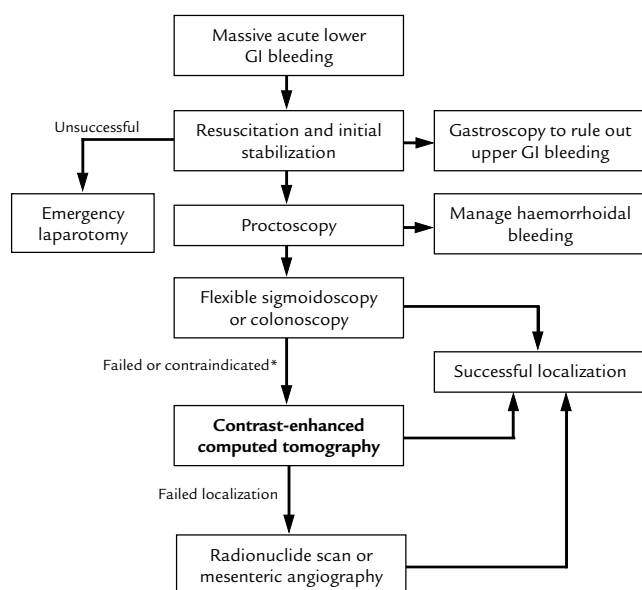


Figure 3. Proposed algorithm for the investigation of massive lower gastrointestinal (GI) bleeding. *Unable to visualize, labile vital signs, unable to prep bowel.

MSCT is fast and allows for excellent reformation on different planes compared to conventional CT. These are clear advantages in an emergency setting for accurate localization prior to surgery.

Ernst et al reported the successful utilization of contrast-enhanced helical CT in the localization of the source of lower gastrointestinal haemorrhage.⁸ In their series of 24 patients, the sensitivity was 79%.⁸ In a swine model, it was shown that helical CT could demonstrate active colonic haemorrhage at rates of less than 0.07 mL/min.⁹ This information suggests that CT is even more sensitive compared to angiography, which is estimated to detect arterial bleeding at a rate of more than 0.5 mL/min.¹⁰

At present, there are no prospective randomized studies comparing the various methods of localization in acute lower gastrointestinal bleeding (MSCT, nuclear radionuclide scan, angiography, colonoscopy). We believe that MSCT is more advantageous as it is rapid, readily accessible and noninvasive compared to the other methods. With contrast-enhanced CT, patients can be appropriately selected for surgery if localization is positive, thus avoiding the need for further time-consuming investigations before definitive surgery. In patients where MSCT is negative in localizing the source of

bleeding, other methods such as mesenteric angiography may be utilized. The use of MSCT should be incorporated into the algorithm for the investigation of acute lower gastrointestinal bleeding, and its usefulness should be validated in further studies. The algorithm we propose for the investigation of acute lower gastrointestinal bleeding is shown in Figure 3.

Conclusion

Contrast-enhanced MSCT has the potential to accurately localize the source of bleeding in an emergency setting, and it should be part of the algorithm in the management of acute lower gastrointestinal bleeding. In an acute setting in patients with labile parameters where time is of the essence for prompt localization prior to surgical resection, we propose that MSCT can identify the site of haemorrhage and, hence, negates the need for a blind total colectomy.

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